

# **BOOT WITH OVERSIZED TOE BOX FOR THERMAL INSULATION**

## **FIELD OF THE INVENTION**

This invention relates to footwear and in particular to boots, such as hunting boots, which may be worn for extended periods of time often in frigid conditions. The boot of the present invention provides improved cold weather insulation in the toe area.

## **DESCRIPTION OF THE PRIOR ART**

A hunter in the field often experiences frigid conditions and hunting boots must have proper cold weather insulation, particularly in the toe area, for medical and comfort reasons. In certain prior art boots, as to which the present invention is an improvement, a waterproof bootie surrounded the wearer's foot and a relatively thin quilted layer of cold insulating material was located above the toe region of the bootie. A toe box, generally formed of plastic material, was located directly above the quilted layer of insulating material and in many instances, but not always, a thick layer of cold insulating material which provided the principal cold insulation for the boot overlaid the toe box and waterproof bootie. A leather outer layer overlaid the thick layer of cold insulating material.

The thick layer of cold insulating material referred to above included a volume of dead air which contributed to the thermal insulating qualities of the layer. In prior art boot construction, the leather was stretched over the toe box to prevent wrinkles in the leather and in doing so, the thick insulating layer was compressed causing a reduction in the volume of thermal insulating dead air. The reduction of dead air caused a reduction in the thick insulating layer of

the boot.

While the relatively thin quilted layer of cold insulation material on the bootie was not compressed during boot construction and therefore retained its insulation efficiency, the size of the toe box limited the size of the quilted layer and its insulating effectiveness.

In addition to the prior art just described, the prior art included a safety shoe, U.S. Pat. No.4,908,963, that comprised heat insulation material extending below both a metallic box toe and a metatarsal guard. An additional layer of heat protecting material extended over the metatarsal guard. The insulating or heat protecting material disclosed in the patent impeded heat, from entering the footwear. There also was disclosed in U.S.Pat No.5,150,536 an oversized boot in which the upper was lined with insulating material.

### **SUMMARY OF THE INVENTION**

According to the present invention, a boot comprises an oversized toe box in which substantially more cold weather insulation is provided than in a boot having a conventional toe box. A clearer understanding of the invention will be had from consideration of the following description and drawings in which:

### **BRIEF DESCRIPTION OF THE DRAWINGS**

FIG.1 is a sectional elevational view of the toe portion of a prior art boot;

FIG.2 is a perspective view of the plastic toe box incorporated in the prior art boot;

FIG.3 is a sectional elevational view of the toe portion of the boot of the present invention; and

FIG.4 is a perspective view of the oversized plastic toe box incorporated in the boot of the present invention.

## DESCRIPTION OF THE PREFERRED EMBODIMENT

### A. The Prior Art

The toe portion 1 of a prior art boot shown in FIG.1 and FIG.2 comprises a leather outer layer 2 beneath which is a relatively thick layer of cold insulating material 4, such as, for example, the high loft fiber insulation sold by 3M corporation under the "Thinsulate" trademark. The original thickness of insulating layer 4 may vary between approximately .315 inches and .54 inches. When, however, the prior art boot is constructed, the leather outer layer 2 is stretched, either manually or mechanically, over the toe area to prevent wrinkles in the toe area. That stretching of the leather causes compression of the insulating layer 4 to a thickness of between approximately .119 inches and .276 inches. Compression of insulating layer 4 reduces the amount of dead air space therein and the corresponding thermal efficiency of insulating layer 4.

A plastic toe box 6 which may be formed of styrene is adhesively secured to the bottom of insulating layer 4. The plastic toe box 6 is formed from a flat sheet during the process in which the boot is lasted. While varying with fashion trends and functional requirements, it is common for the prior art plastic toe box 6, to have a maximum height of approximately 1.5 inches and a maximum length of approximately 1.75 inches. A vamp lining 3 extends below the insulating layer 4 and plastic toe box 6 and may be adhesively secured thereto. A waterproof bootie 8, formed for example, of material sold by W.L. Gore under the "Gore-Tex" trademark includes a relatively thin quilted layer 10 of cold insulating material above the toe region of the

bootie 8. The thickness of the quilted layer 10 is generally about .24 inches. The quilted layer 10 is secured to the bootie 8 and is formed of 200 gram batting, i.e. a one inch thick layer of insulating material weighing 200 grams per square inch. The quilted layer 10 is secured to the underside of vamp 3 by suitable means such as latex cement. The leather outer layer 2, insulation layer 4, plastic toe box 6, vamp 3 and bootie 8 are attached to outsole 12 in known manner.

#### **B. The Present Invention**

The toe portion 14 of a boot of the present invention, shown in FIG.3 and FIG. 4 comprises a leather outer layer 16 beneath which is an oversized plastic toe box 18, formed in the same manner as the plastic toe box 6 shown in FIG.1 and Fig.2. In the oversized plastic toe box 18, the height may vary between 1.9 inches and 2.5 inches, while the length may vary between 2.0 inches and 2.75 inches. A cold insulating layer 20, which is the same material as layer 4 in the boot of FIG.1 and Fig.2 is adhesively secured to the underside of the toe box 18. The interior of the toe box 18 is substantially larger than the interior of toe box 6 and therefore the cold insulating layer 20 is able to fit within toe box 18 while still allowing room for the wearer's toes. The smaller interior of prior art toe box 6 could not permit layer 4 to fit within toe box 6 and still allow room for the wearer's toes.

It will be understood that the cold weather insulating layer 20, because it is within toe box 18 is not compressed by the stretching of the leather over the toe area as was the cold insulating layer 4 in the prior art boot of FIG.1. Thus, the amount of dead air space in cold insulating layer 20, and the consequent ability of cold weather insulating layer 20 to retain heat is not reduced as was the cold weather insulating layer 4. The thickness of cold weather insulation layer 20 may, for example, vary between .75 inches and 1.00 inches.

It will be appreciated that the uncompressed cold insulating layer 20 provides

superior cold weather insulation than does the compressed cold weather layer 4 of the prior art boot . A vamp lining 17 extends below insulating layer 20 and may be adhesively secured thereto. Another vamp lining (not shown) maybe adhesively secured to the underside of outer layer 16 for added strength, although any such vamp lining may adversely affect the breathability of the boot. Waterproof bootie 8, previously described, may be adhesively secured to he underside of vamp lining 17. Here again outer layer 16, plastic toe box 18, insulation layer 20, vamp lining 17 and bootie 8 are attached to outsole 24 in known manner.

This invention has been described above with reference to a presently preferred embodiment of the invention. The description, however, has not been presented as a catalog exhaustive of all forms which the invention may take. It will be understood that the size of the oversize plastic toe box 18 and the insulation layer 20 may be varied to satisfy the desired thermal insulation requirements of the boot. Accordingly, workers skilled in the art to which this invention pertains will readily appreciate that variations, alterations or modifications in the structure's procedures, and arrangements described above may be practiced without departing from the scope of this invention. This, the foregoing description should not be read as limiting the scope of this invention to less than the fair scope of the following claims.